s/020/60/135/006/006/037 C 111/ C 333

Asymptotic Expansions of Solutions to Ordinary Linear Differential Equations Having Small Coefficients With Their Higher Derivatives in the Neighborhood of an Fregular Singular Point

In the Neighborhood of an irregular Singular Point 
$$\lim_{s\to 0} \psi_k(s, \delta_0) = \psi_k(\delta_0) = \begin{cases} \psi_k^0 & \text{if } 2 \le k \le m \\ \psi_k^0 - \delta_0 & \text{if } m+1 \le k \le n \end{cases}$$

Let 
$$\Upsilon_0 \subseteq \Upsilon_k(S_0) \subseteq \Upsilon_0 + 2\pi$$
. Let

(13) 1.) 
$$z \in G_k(9, \delta_0)$$
 if  $-2/3 \pi - \psi_k(9, \delta_0) < \arg z <$ 

2.) 
$$z \in G_k(\mathcal{S}_0)$$
, if  $-2/3\pi - \psi_k(\mathcal{S}_0) < \arg z < 2/5\pi$   
 $- \psi_k(\mathcal{S}_0)$ 

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Asymptotic Expansions of Solutions to Ordinary Linear Differential Equations Having Small Coefficients With Their Higher Derivatives in the Neighborhood of an Irregular Singular Point

3.)  $z \in G_k^0$ , if  $-2/3\pi - \psi_k^0 < \arg z < 2/3\pi - \psi_k^0$ . Let  $G_k^0$  be the intersection of the  $G_k^0$ ;  $G(\delta_0)$  intersection of the  $G_k(\delta_0)$ ;  $G(\delta_0)$  intersection of the  $G_k(\delta_0)$ . Let  $G_k(\delta_0)$  be narrower than  $G(\delta_0)$  and let it be contained in  $G(\delta_0)$  for all sufficiently small  $\delta_k^0$ . By the transformation

(:4) 
$$W(z, E) = e^{\lambda_1(E)z} z^{\alpha_1(E)} u(z_{\beta}E)$$

let (1) pass over into

(15) L [u; 
$$\mathcal{E}$$
] =  $\sum_{k=m+1}^{n} \mathcal{E}^{k-m} p_k(z, \mathcal{E}) u^{(k)} + \sum_{k=0}^{m} p_k(z, \mathcal{E}) u^{(k)} = 0$ ,

where

 $p_n(z, \mathcal{E}) = 1$ ,  $p_k(z, \mathcal{E}) = \sum_{k=0}^{\infty} \mathcal{E}^{8} a_{k,3}(z) = \sum_{k=0}^{\infty} z^{-8} b_{k,3}(\mathcal{E})$ .

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Asymptotic Expansions of Sclutions to Ordinary Linear Differential Equations Having Small Coefficients With Their Higher Demivatives in the Neighborhood of an Irregular Singular Point

Let 
$$L [u, \varepsilon]$$
 be represented as

(23)  $\overline{L} [u, \varepsilon] = \sum_{S=0}^{\infty} \varepsilon^{S} \overline{L}_{II} [u]$ 

where 
$$L_0[u] = u^{(m)} + \sum_{k=0}^{m-1} a_{k,0}(z) u^{(k)}, L_s[u] = \sum_{k=m+1}^{m} a_{k,s-k+m}(z) u^{(k)} + \sum_{k=0}^{m-1} a_{k,s}(z) u^{(k)}, \text{ where } a_{k,s} = 0 \text{ for } s < 0.$$

Theorem: Let  $u(z, \xi)$  be the solution of (15) and have the asymptotic expansion

(28) 
$$u(z, \xi) \simeq 1 + \sum_{s=1}^{\infty} c_{1,s} (\bar{c}) z^{-s} \text{ in } G_{\alpha}(\bar{s}_{0})$$
.
Card  $6/8$ 

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Asymptotic Expansions of Solutions to Ordinary Linear Differential Equations Having Small Coefficients With Their Higher Derivatives in the Neighborhood of an Irregular Singular Point

Assume that the function u (z) satisfies

(25) 
$$\overline{L} \left[ u_o \right] = 0$$

and has the asymptotic expansion

(27) 
$$u_0(z) \sim v_1(z) = 1 + \sum_{s=1}^{\infty} c_{1,s}^{0} z^{-s} \text{ in } G_0$$

while the functions  $a_s(z)$  are determined by the equations

(26) 
$$\overline{L}_{o} \left[ u_{s} \right] = -\sum_{n=0}^{s-3} \overline{I}_{n} \left[ u_{s-1-n} \right]$$

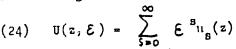
as well as by the conditor that they decrease at infinity as 1/z in G. Then the formal expansion of  $u(z,\mathcal{E})$  in terms of  $\mathcal{E}$  -powers

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s/020/60/135/006/006/037 c 111/ c 333

Asymptotic Expansions of Solutions to Ordinary Linear Differential Equations Having Small Coefficients With Their Higher Derivatives in the Neighborhood of an Erregular Singular Point



is asymptotic in  $G_{\alpha}(\delta_{0})$  for  $\epsilon \to 0$  (arg  $\epsilon = \delta_{0}$ ) so that

 $\lim_{\xi \to 0} u(z, \xi) = u_{c}(z) .$ 

The author thanks Yu. L. Ribinovich and D. P. Kostomarov for assistance.

There are 6 references: 5 Soviet and 1 Belgian.

Lomonosov)

ASSOCIATION: Moskovskiy gosudarstvennyy universitet imeni M. V. Lomonosova (Moscow State University imeni M. V.

PRESENTED: July 7, 1960, by J. G. Petrovskiy, Academician

SUBMITTED: July 7, 1960

Card 8/8



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TUTHOR 1

Khapayer, M. F.

TITLE

The asymptotic development of hypergeometric and

degenerated hyporgeometric functions

PERIODICAL:

Isvestiya vysshikh ushabnykh savedeniy. Matematika,

no. 5, 1961, 98-101

TEXT: The author obtains asymptotic developments of the hypergeometric function  $F(a,b,c,\tau)$  and the degenerated hypergeometric function F(a,c,z) for the case that n and c are large and have the same order. The author starts from the equations

$$z \frac{d^2u}{dz^2} - (z-c) \frac{du}{dz} = 0$$

(:)

and

$$\frac{d^2u}{dz^2} + \left[0 - (a+b+1)z\right] \frac{du}{dz} - abu = 0$$
 (13)

respectively, where  $a = \infty 1$ , a = y1, 1 --1 arge,  $\infty \neq 0$ ,  $y \neq 0$ , he card 1/4

$$\mathcal{E}^{t y''} + \left[ \mathcal{E}^{t}(d+1) + \mathcal{Y} \right] v' + \mathcal{E}^{t} dv = 0$$
 (2)

with  $v(t) = e^{-t}u(\frac{\sqrt[4]}{\sqrt[4]}t)$ ;  $d=1-\frac{\sqrt[4]}{\sqrt[4]}$ ;  $\xi=\frac{1}{1}$ . The asymptotic development of the solution of (2) regular in 0 corresponds to F(a,0,z).

Thus the author obtains the developments

$$F(\infty 1, \gamma 1, z) \simeq e^{\frac{2}{\chi}z} \left\{ 1 + \frac{1}{1} - \frac{\left(\frac{\infty}{\chi}\right)^{2}}{2} \left( \frac{1}{2} - \frac{1}{\chi} \right) + \frac{1}{1^{2}} \left( \cdots \right) + \cdots \right\} \right\}$$

and

$$F(a,b,c,z) = u(t) \simeq$$
 }. (17)

Card 2/4

S/140/61/000/005/007/007 C111/C222

The asymptotic development . . .

$$\simeq (1-t)^{-b} \left\{ 1 + \mathcal{E} \frac{b(b+1)}{2} \left( \frac{1}{Y} - \frac{1}{c\ell} \right) \frac{1-2t}{(1-t)^2} + \mathcal{E}^2(\dots) + \dots \right\}.$$
 (17)

For large m,n and  $\left|\frac{m-n}{m+n}\right| <<1$  from (17) it follows a new asymptotic development for the adjoint Legendre functions:

$$P_{n}^{m}(x) = \frac{\Gamma(m+n)}{2^{m}\Gamma(m)\Gamma(n-m)} (x^{2}-1)^{\frac{m}{2}} F\left(m-n; n+m+1; m+1; \frac{1-x}{2}\right) \approx \frac{\Gamma(m+n)}{2^{m}\Gamma(m)\Gamma(n-m)} (x^{2}-1)^{\frac{m}{2}} \left(1 - \frac{n+m+1}{m+1} \frac{1-x}{2}\right)^{n-m} \times \left\{1 + \frac{(m-n)(m-n+1)n}{2(m+1)(m+n+1)}, \frac{1 - \frac{n+m+1}{m+1} (1-x)}{\left(1 - \frac{n+m+1}{m+1} \frac{1-x}{2}\right)^{\frac{n}{2}} + \dots\right\}$$

Card 3/4

s/140/61/000/005/007/007 C111/C222

The asymptotic development . . .

The author thanks Yu. L. Rabinovich for the attention for the paper. There are 2 Soviet-bloc and 1 non-Soviet-bloc references.

ASSOCIATION: Moskovskiy gosularstvennyy universitet imeni M. V. Lomonosova (Moscow State University imeni M.V.Lomonosov)

March 28, 1959 SUBMITTED:

Card 4/4

S/042/61/016/004/004/005 0111/0444

AUTHOR:

Khapayev, M. M.

TITLE:

Linear differential equations with small coefficients at some of the highest order derivatives in the neighborhood of an inessential singular point

Uspekhi matematicheskikh nauk, v.16, no. 4, 1961,

PERIODICAL:

187-194

TEXT: The following equation is considered

TEXT: The following equation is constructed by 
$$\frac{d^{n}u}{dz^{n+k}} = \sum_{h=0}^{m} z^{h} \overline{p}_{h}(z, E) \frac{d^{h}u}{dz^{h}} = 0$$
 (1)

where  $\bar{p}_{1}(z,\xi)$  are analytic with z and  $\xi$  in the neighborhood of the point (0,0),  $\overline{p}_{m+k}(0,0) \neq 0$  and  $\overline{p}_{m}(0,0) \neq 0$ . The point z = 0 is an inestential singular point of (1). The coefficients  $\mathcal{E}^{k} z^{m+k} \overline{p}_{m+k}(z, \mathcal{E})$ have a zero of at least k order for z=0 with respect to E, if  $1 \le k \le \mu-1$ , and a zero of kth order, if  $k=\mu$ . The defining Card 1/4-

\$/042/61/016/004/004/005

Linear differential equations with . . . C111/C444

equation for the characteristic exponents g of the point z = 0 is

$$\sum_{k=1}^{m} g(g-1)...(g-m-k+1) \in {}^{k}\bar{p}_{m+k}(0,\epsilon) + \\ + \sum_{h=0}^{m} g(g-1)...(g-h+1) \bar{p}_{h}(0,\epsilon) = 0$$
 (2)

For  $\mathcal{E} \to 0$   $\mu$  roots of (2) go to infinity and m roots pass continuously over into the roots of the defining equation

$$\sum_{h=0}^{m} S(g-1) \dots (g-h+1) \overline{p}_{h}(0,0) = 0$$
 (3)

of the degenerate differential equation. Let  $g_1$  be a simple root of (3)

and  $S_1(E)$  be a root of (2), where  $S_1(0) = S_1$  and (2) do not possess

any roots  $S_1(\mathcal{E}) + 1$ , 1 > 0 being an integer.

If one putsu(z,  $\mathcal{E}$ ) =  $z^{S_1(\mathcal{E})}$  w(z,  $\mathcal{E}$ ), then w(z,  $\mathcal{E}$ ) satisfies the equation Card 2/4

 $$\rm S/042/61/016/004/005$  Linear differential equations with . . C111/C444

$$\mathcal{L}[w] = \sum_{k=1}^{m} \varepsilon^{k} z^{m+k-1} p_{m+k}(z, \varepsilon) w^{(m+k)} + \sum_{h=1}^{m} z^{h-1} p_{h}(z, \varepsilon) w^{(h)} + p_{0}(z, \varepsilon) w = Q(5)$$

This equation possesses a regular solution for : = 0 which can be searched formally in the form

$$\overline{w}(z,\varepsilon) = \sum_{i=0}^{\infty} \varepsilon^{i}w_{i}(z)$$
 (9)

 $w_i(z)$  are determined by recurrent relations after putting (9) in (5) and by the initial conditions

$$W_0(0) = 1, W_{h+1}(0) = 0 \quad (h = 0, 1, 2, ...)$$
 (11)

The author proves that the formal expansion (9) is the asymptotic expansion of the regular solution of (5) in a domain G. The domain G consists of the  $\xi$  - plane, out of which certain angular domains are cut; z must satisfy the condition  $|z| < R_2$  where a certain upper Card 3/4

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Linear differential equations with . . . C111/0444

bound is given for R2.

A. N. Tikhonov, A. B. Vasil'yeva, J. S. Gradshteyn are mentioned; the author thanks Yu. L. Rabinovich for useful advices.

There are 4 Soviet-bloc references and 1 non-Soviet-bloc reference.

SUBMITTED: August 17, 1959

Card 4/4

5/039/62/057/002/002/003 B172/B112

AUTHOR:

Khapayev, M. M. (Moscow)

TITLE:

Asymptotic expansions in the neighborhood of an irregular pole of solutions of ordinary linear differential equations

with small coefficient in the higher derivatives

PERIODI CAL:

Matematicheskiy sbornik, v. 57(99), no. 25 1962, 187-200

TEXT: An equation

 $\frac{1}{\sum_{k=m+1}^{n} \epsilon^{k-m} \bar{p}_{k}(z,\epsilon) w^{(k)} + \sum_{k=0}^{m} \bar{p}_{k}(z,\epsilon) w^{(k)} = 0}$ 

with  $p_n(z, \varepsilon) = 1$ ,  $\lim p_m(z, 0) \neq 0$  is considered. The coefficients  $p_k$  are assumed to be analytic in the neighborhood of  $\varepsilon = 0$ ,  $z = \infty$ . This point then is an irregular second-order pole. The formal solutions of the differential equation can be constructed as normal series. For each formal differential equation, a complete neighborhood of the point, at infinite distance, can be decomposed into a series of angular domains in such a way that, for Card 1/2

KHAPAYEV, M.M. (Moskva)

Asymptotic behavior near an irregular singular point of solutions of ordinary linear differential equations with small coefficients at the higher derivatives. Mat. sbor. 57 no.2: 187-200 Je '62. (MIRA 15:6) (Differential equations, Linear)

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THE: On the stability of motion	of a charged particle in a magnetic field B	
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FITLE: Or fields	focusing of beams	f high speed charged particles in stellerator type	
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		$z=u'$ , $\omega=uv$ .	
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ACCESSION NH:

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AUTHOR: Khapayev, M. M.

TITLE: Nonlinear theory of the motion of fast charged particles in helical toroldal

magnetic fields

SOURCE: AN SSSR. Doklady, v. 163, no. 2, 1965, 343-346

TOPIC TAGS: charged particle, particle acceleration, helical magnetic field,

focusing accelerator

ABSTRACT: The author considers helical fields rolled into a torus whose central diameter R is much larger than the cross section diameter oo; the pitch L of the helical field is also assumed larger than oo. Such magnetic fields can be used for hard focusing of charged particles in accelerators and charged-particle guidance systems. An averaging method is used to construct adiabatic invariants, which describe nonlinear oscillations analogous to betatron oscillations. The equations describing these oscillations are linearized for small oscillation amplitudes, and formulas describing the main limear resonances of the system are obtained for ineir frequencies. The motion of the particle in such a field is considered both in the presence and in the absence of a turning field. Relations are obtained between the parameters of the system (R, L, oo) and the intensities of the helical and turning

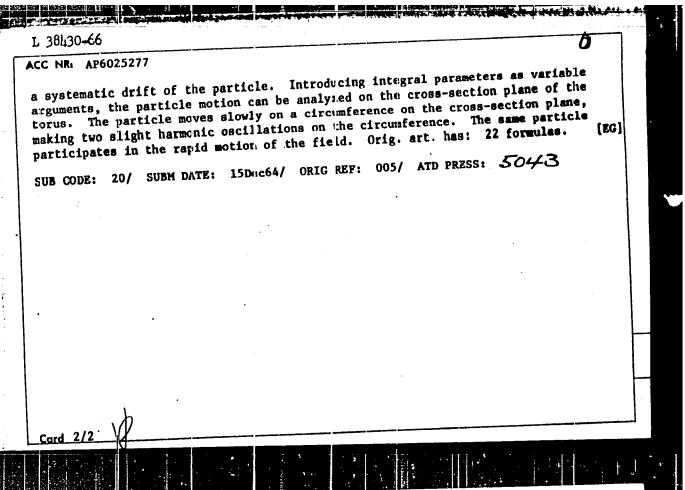
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ACC NR: AP6025277  SOURCE CODE: UR/0188/66/000/003/0040/0046  ACT NR: AP6025277  SOURCE CODE: UR/0188/66/000/003/0040/0046  ACT NR: AP6025277  AUTHOR: Khapayev, M. M.  ORG: Department of Mathematics, Moscow State University (Kafedra matematiki, Moskovskiy gosudarstvenniyy universitet)  TETLE: Monlinear motion theory of fast charged particles in helical toric magnetic fields  SOURCE: Moscow. Universitet. Vestnik. Seriya III. Fizika, astronomiya, no. 3, 1966, 40-46  TOPIC TAGS: feese fields, particle motion, fast particle, charged particle. The fields are analysed. These fields are bent into tori with ABSTRACT: Helical force fields are analysed. These fields are bent into tori with a chosen radius R which is greater than the radius of of the toric cross section. A particle moves in the toric field under the action of an upturning force and without it. The motion is analyzed by polar coordinates on the plane of the toric cross section. The potential equation is expressed by the toric parameters and the Bessel function of complex arguments which can be expanded into parameters and the Bessel function of complex arguments which can be expanded into series. Equations for the components of the helical field with an upturning field were developed. A fast particle, moving along the axis of the helical field, can be considered to be under the action of a rapidly rotating force. This force causes Carell 1/2  UDC: 621.384.6.04	41		
AUTHOR: Khapayev, M. M.  ORG: Department of Mathematics, Moscov State University (Kafedra matematiki, Moskovskiy gosudarstvenky) universitet)  THTLE: Nonlinear motion theory of fast charged particles in helical toric magnetic fields  SOURCE: Moscow. Universitet. Vestnik. Seriya III. Fizika, astronomiya, no. 3, 1966, 40-46  TOPIC TAGS: fore field, the constant, potential particle, charged harmonic oscillation, harmonic fields are analysed. These fields are bent into tori with a chosen radius R which is greater than the radius of the toric cross section. The motion in this field occurs on a helix whose pitch L is greater than the radius of the toric cross section. A particle moves in the toric field under the action of an the toric cross section. A particle moves in the toric field under the action of an upturning force and without it. The motion is analyzed by polar coordinates on the plane of the toric cross section. The potential equation is expressed by the toric parameters and the Bessel function of complex arguments which can be expanded into series. Equations for the components of the helical field with an upturning field were developed. A fast particle, moving along the axis of the helical field, can be considered to be under the action of a rapidly rotating force. This force causes		COLD OF 100 / 100	
ORG: Department of Mathematics, Moscov State University (Kafedra natematiki, Moskovskiy gosudarstveniyy universitet)  TETIE: Nonlinear motion theory of fast charged particles in helical toric magnetic fields  SOURCE: Moscow. Universitet. Vestnik. Seriya III. Fizika, astronomiya, no. 3, 1966,  TOPIC TAGS: force field, planticle motion, harmonic oscillation, hastele magnetic fields are bent into tori with ABSTRACT: Helical force fields are analysed. These fields are bent into tori with a chosen radius R which is greater than the radius o of the toric cross section. The motion in this field occurs on a helix whose pitch L is greater than the radius of the toric cross section. A particle moves in the toric field under the action of an upturning force and without it. The motion is analyzed by polar coordinates on the plane of the toric cross section. The potential equation is expressed by the toric parameters and the Bessel function of complex arguments which can be expanded into series. Equations for the components of the helical field with an upturning field were developed. A fast particle, moving along the axis of the helical field, can be considered to be under the action of a rapidly rotating force. This force causes	A	ACC NR: AP6025277	
ORG: Department of Mathematics, Moscov State University (Kafedra natematiki, Moskovskiy gosudarstveniyy universitet)  TETIE: Nonlinear motion theory of fast charged particles in helical toric magnetic fields  SOURCE: Moscow. Universitet. Vestnik. Seriya III. Fizika, astronomiya, no. 3, 1966,  TOPIC TAGS: force field, planticle motion, harmonic oscillation, hastele magnetic fields are bent into tori with ABSTRACT: Helical force fields are analysed. These fields are bent into tori with a chosen radius R which is greater than the radius o of the toric cross section. The motion in this field occurs on a helix whose pitch L is greater than the radius of the toric cross section. A particle moves in the toric field under the action of an upturning force and without it. The motion is analyzed by polar coordinates on the plane of the toric cross section. The potential equation is expressed by the toric parameters and the Bessel function of complex arguments which can be expanded into series. Equations for the components of the helical field with an upturning field were developed. A fast particle, moving along the axis of the helical field, can be considered to be under the action of a rapidly rotating force. This force causes	ı	AUTHOR: Khapayev, M. M.	
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## CIA-RDP86-00513R000721810002-0

EML(7) IJP(c) SOURCE CODE: UR/0376/66/002/005/0600/0608 I. 063211-67 ACC NR: AP6017847 AUTHOR: Khapayey, M. M. ORG: Moscow State University im. M. V. Lomorosov (Moskovskiy gosudarstvennyy universitet) 22 TITLE: Method of averaging and several problems connected with averaging 19 SOURCE: Differentsial'nyye uravnuniya, v. 2, no. 5, 1966, 600-608 B TOPIC TAGS: ordinary differential equation, approximation method ABSTRACT: A proof is given of N. N. Bogolyubov's averaging principle, which is based on the direct comparison of solutions of the input and averaged systems under general assumptions about the right-hand member. The object of study is systems of ordinary differential equations describing the motion of charged particles in special magnetic fields. For the system  $\frac{dx}{dt} = \varepsilon X(t, x)$ the following theorem is proved: Let a function X(t,x) be defined for t>0 and x belonging to a region D, and let the following conditions be fulfilled: a) X(t,x) satisf fies Karateodori's conditions, which assure the existence of a continuous solution x(v); b) there exists a summable function l(t) and a constant  $N_0$  such that for  $t \ge 0$ UDC: 517. 934 se Cord 1/3

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ACC NR: AP6017847

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and t > 0 and  $x \in D$   $|X(t, x)| \leq N(t)$ , and for any finite interval  $[t_1, t_2]$  the following holds

$$\int_{t_1}^{t_2} N(t) dt \ll V_0(t_2-t_1);$$

c) there exists a summable function H(t) and a constant  $H_0$ , and also a non-vanishing function  $\psi(\alpha)$ ,  $\lim_{\alpha \to 0} \psi(\alpha) = 0$ , such that for t > 0 and  $x \in D$ 

$$|X(t, x') - X(t, x')| < \psi(|x' - x'|) H(t), \quad |H(t) dt < H_0(t_2 - t_1)$$

on any finite interval  $[t_1, t_2]$ ; (1) there exists a limit in D uniform relative to x

$$\lim_{T\to\infty}\frac{1}{T}\int_0^T X(t,x)\,dt=X_0(x);$$

e)  $X_0(x)$  in region D satisfies the Lipschitz condition  $|X_n(x') - X_n(x'')| \le \lambda |x' - x''|.$ 

Then with any  $\eta > 0$ , however small, and with any large L one may associate a quantity  $\epsilon_0$  such that if  $\xi = \xi(t)$  is a solution of the averaged system

$$\frac{d\xi}{dt} \simeq \epsilon X_0(\xi),$$

defined in the interval 0 < t <  $\infty$  and lying in region D along with its  $\eta$ -neighborhood,

Card 2/3

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L 063; h: 67.

then for  $0 < \varepsilon < \varepsilon_0$  in the interval  $0 < t < \frac{L}{\varepsilon}$  the following inequality holds  $|x(t)-\xi(t)|<\eta,$ 

in which x(t) is a solution of system (1) coinciding with  $\varepsilon(t)$  when t=0. The author thanks A. N. Tikhonov, B. M. Budak, and V. M. Volosov for their useful comments. Orig. art. has: 45 formulas.

SUB CODE: 12/

SUBM DATE: 14Jun65/

ORIG REF: 010/

OTH REF: 002

#### CIA-RDP86-00513R000721810002 **APPROVED FOR RELEASE: 09/17/2001**

ACC NR: AT6034338

This, in turn, yields the characteristic equation for the cyclotron frequency V. The particle motion is then analyzed for small values of the parameter &, and it is particle motion is then analyzed for small  $\gamma$ , given by shown that the adiabatic invariants  $\lambda$  and  $\gamma$ , given by  $\rho^2(\gamma + s_0) = \lambda, \quad \frac{\lambda^2}{\rho^2} + \rho^2(s_0^2 + \frac{1}{2} + \rho^2) = \gamma$ 

describe a slow, nonlinear oscillation for the particle motion. Orig. art. has: 22 equations.

SUBM DATE: 28Jan65/ ORIG REF: 009 SUB CODE: 20/

### "APPROVED FOR RELEASE: 09/17/2001

### CIA-RDP86-00513R000721810002-0

AUTHOR:

Khapayev, P.V., Engineer

SOV-91-58-4-6/29

TITLE:

On the Article of S.S. Gadzhiyev "On the Increase of the Number of Consumer Lines Connected with One Common Switch of 6 and 10 ky" (Po povodu stat'i S.S. Gadzhiyeva "Ob uvelichenii chisla potrebitel'skikh liniy, podklyuchayemykh

pod odin vykl;ruchatel: 6 i 10 kv")

PERIODICAL:

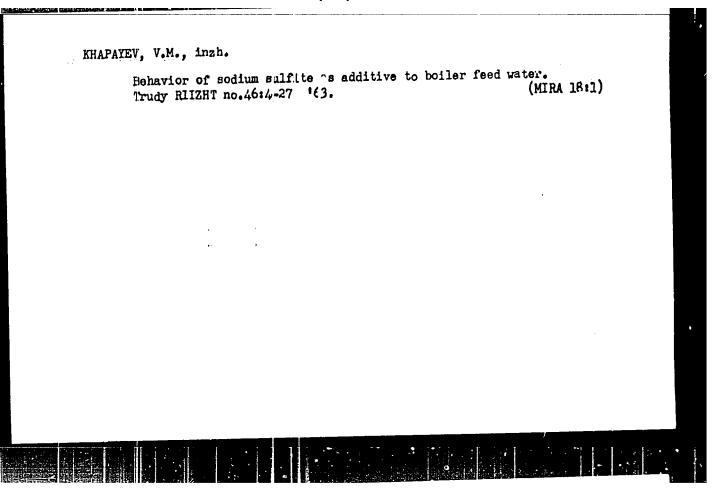
Energetik, 1958,0 Nr 4, p 7, (USSR)

ABSTRACTS

The author questions statement of S.S. Gadzhiyev that economy of an installation can be obtained by an increase of the number of consumer lines connected with one common switch of 6 and 10 ky. None of the circuits illustrating his article is justified by practical need. On the contrary, the reliability of the consumer's power supply is lowered.

1. Switching systems--Effectiveness

Card 1/1



KHAPAYEV, V.M., inzh.

Behavior of sodium sufite when used as an additive in boiler water.

Teploenergetika 11 no. 1:49-52 Ja 164. (MIRA 17:5)

1. Rostovskiy institut irzhenerov zheleznodorozhnego transporta.

KHAPAYEV, V.M., inzh.; KUBANOV, A.T., inzh. Wash-off of silicic acid deposits in the sulfitation of boiler (MIRA 18:1) feedwater. Trudy RIIZHT no.46:28-35 '63.

KVAKIN, S.D., inzh.; KUBANOV, A.T., inzh.; KHAPAYEV, V.M., inzh. Steam corrosion of steel used in the manufacture of boiler turbines in the presence of the products of decomposition of sodium sulfite.

(MIRA 18:1) Trudy RIIZHT no.46:36-41 163.

CIA-RDP86-00513R000721810002-0" APPROVED FOR RELEASE: 09/17/2001

### KHAPAYEVA, A.K., inzh.

Interuniversity conference devoted to the 22nd Congress of the CPSU. Izv. vjs. ucheb. zav.; energ. 4 no.8:123-125 Ag '61. (MIRA 14:8)

1. Leningradskiy politekhnicheskiy institut im. M.I. Kalinina.

(Hydraulic engineering)
(Electric power plants)

14

# KHAPAZHEU T.Sh.

USSR/Pharmacology, Toxicology - Negrecties.

U-l

# Abs Jour APPROYED FOR RELEAGE 3,09/587/12001 CIA-RDP86-00513R000721810002

Author

Shautsukova, L.K., Mkhashonov, N.I., Khapazhev, T.S.,

Khakulov, L.A., Dzolilayev, A.A.

Inst Title knakulov, L.A., Dzoniayev, A.A.

: Certain Physiologic and Biochemical Changes in Rabbits During Amytal-Induced Sleep.

Orig Pub

: Uch. Zap. Kabardinsi: gos. ped. in-t, 1956, vyp. 10, 113-

126.

Abstract

Experiments were performed on male rabbits. A 15% solution of sodium amytal in a dose of 1.5-2 ml. was administered into the ear rein on 3 successive days. During the amytal-induced sleep, total plasma proteins decreased in proportion to the duration of the sleep. Blood sugar and iron decreased during the first two days but then began to increase until the sleep was terminated. During the amytal-induced sleep there was a decrease in Hb. and

Cand 1/2

U-l

KHAPAZHEV, T.Sh.

Thresholds of the formation and the characteristics of local responses of the surface of the cerebral cortex evoked by direct electric stimulation under the influence of stimulants and narcotics. Vest. IGU 18 no.9:115-131 '63. (MIRA 16:5) (STIMULANTS) (ELECTROENCEPHALOGRAPHY) (NARCOTICS)

KHAPAZHEV, T. Sh.

Eff of of burbiturates on the excitability and electric activity of the cerebral cortex. Nerv. sist. no.48135-139 163 (MIRA 18:1)

l. Fiziologicheskiy institut Leningradskogo missersiteta.

BARADULINA, Mariya Georgiyevna; KHAPERIYA, R.V., red.; PRONINA, N.D., tekhn. red.

[Clinical aspects and treatment of regional metastases in laryngeal cancer] Klinika i lechenie regional'nykh metastasov raka gortani. Moskva, Medgiz, 1963. 166 p.

(MIRA 16:10)

(LARYNI—CANCER) (METASTASIS)

30963. KHAPILIN, A. G., MOISEYEV, S. G., AND SOKOLOVA, V. P.

Lechenie penitsillinom v klinike vmutrennikh bolezney. V sb: Voprosy ostroy vnutrenney kliniki. M., 1949, s. 247-58

21012 8/058/61/000/005/020/050 A001/A101

2 4 66 00 AUTHORS:

Moromova, P.V., Tleubergenova, G.A., Khapilin, V.N.

TITLE:

Interaction of 660-Nev protons with nuclei of light and heavy

elements of the photoemulsion

PERIODICAL:

Referitivnyy zhurnal. Fizika, no 5, 1961, 99-100, abstract 5B433 ("Uch. zap. Alma-Atinsk. gos. ped. in-t, 1958, (1959), v 12, no 2,

172-187)

TEXT: Stars produced by 660-Mev protons in nuclei of light (C,N and 0) and heavy (Ag and Br) elements were studied with the aid of HMKOM (NIKFI) photomulsion. The total effective cross section was determined for inelastic interactions of protons with nuclei of the emulsion. Differential cross sections agree with that calculated on the basis of the optical nucleus model. Recoil protons formed in light nuclei possess higher energies than protons from heavy nuclei. The study of angular distribution of cascade particles has shown the preferential forward directional flux in light nuclei.

[Abstracter's note: Complete translation.]

Card 1/1

TLIN, K.P., kand. tekim. nauk; KHAFILOV, Yu.A., kand. tekim. nauk; SHESTAKOV, Yu.K., inzh.

Specialization of gondols cars is an efficient measure. Zhel. dor. transp. 47 no. 11:22-26 N \*65 (MIRA 19:1)

KHAPILCY, Yu. A.

"Choosing a Rational Method and the Fundamental Parameters of the Heating of a Railroad Car." Cand Tech Sci, Moscow Order of Lenin, and Labor Red Banner Inst of Railroad Transport Engineers imena I. V. Stalin, Min Railways USSR, Moscow, 1954. (KL, No 1, Jan 55)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational. Institutions (13) SO: Sun. No. 598, 29 Jul 55

> CIA-RDP86-00513R000721810002-0" **APPROVED FOR RELEASE: 09/17/2001**

KHAPILOV, Yu.A., kand. tekhn. nauk; TALAIAY, V.I., inzh.

Design and calculation of the curve-in ability of coupled cars.

Vest. TSNII MPS 25 no.1:31-34 '66. (MIFA 19:2)

KHAPILOV, Thus, mladshiy nauchnyy sotrudnik; ZHURILOV, V., mladshiy nauchnyy sotradnik

Use by foreign countries of plastics and synthetic materials in shirbuilding (from "Quarterly Transactions of the Institute of the Institute of Naval Architecture." no.3, July 1958). Mor.flot 19 no.8:

(MIRA 12:11)
38—10 Ag '59.

1. Institut kemplekenykh transportnykh problem AN SSSR. (Shipbuilding) (Plastics)

### "APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000721810002-0

ACC NR: AP7003257

(N

SOURCE CODE: UR/0207/66/000/006/0096/0097

AUTHOR: Khapilova, N. S. (Novosibirsk)

ORG: none

TITLE: Axisymmetrical flow in a thin layer of fluid on the surface of a revolving

body of revolution

SOURCE: Zhurnal prikladnoy mekhaniki i tekhnicheskoy fiziki, no. 6, 1966, 96-97

TOPIC TAGS: body of revolution, fluid flow, boundary flow, exisymmetric flow

ABSTRACT: This paper examines a problem earlier proposed by the author in which a system of equations was derived which describes flow in a fluid layer on the surface of a revolving body of revolution in a nonstationary system of coordinates associated with the body. Only axisymmetrical flow is studied. An analysis of theoretical data shows that in calculating nonsteady axisymmetric flow in a tube of finite length two boundary conditions must be given on the left and one on the right if the flow is "precritical," i.e.,  $\mathbf{v}_1 < \sqrt{\mathbf{fh}}$ , or three boundary conditions on the left if flow is "supercritical," i.e.,  $\mathbf{v}_1 > \sqrt{\mathbf{fh}}$ . When specifically choosing the boundary conditions in the case of steady axisymmetric flow it is of interest to study the possible forms

in the case of steady axisymmetric flow it is of interest to study the possible forms of the free surface. The author introduces the concept of critical depth into the equations studied to determine the pre- or supercriticality of flow conditions. At

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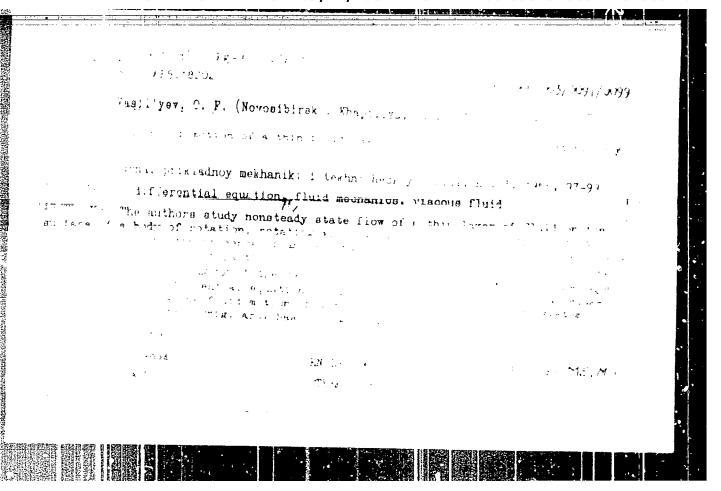
## "APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000721810002-0

VASILYEV, O.F.; KHAPILOVA, N.S. (Novosibirsk)

"An analysis of axisymmetric swirling inviscid flow in bounded regions"

report presented at the 2nd All-Union Congress on Theoretical and Applied Mechanics, Moscow, 29 January - 5 February 1964



ERT(1)/EMP(m)/ENT(m)/T IJP(c) DS/WW/DJ ACC NRI AP6013205 SOURCE CODE: UR/OL21/66/000/002/0102/0107 AUTHOR: Nikitin, A. K. (Rostov-na-Donu); Khapilova, (Rostov.na-Donu) and sinkly ORG: none TITLE: The nonlinear problem of a spherical suspension SOURCE: AN SSSR. Izvestiya. Mekhanika zhidkosti i gaza, no. 2, 1966, 102~107 TOPIC TAGS: nonlinear theory, viscous flow ABSTRACT: The article treats the problem of the steady state motion of en incompressible viscous fluid between two concentric spheres. Into the gap between the spheres iluid is fed in through one opening, and through another opening it is withdrawn. The two concentric spheres are designated  $A_1$  and  $A_2$ , and their radii as  $r_1$  and  $r_2$  ( $r_1 < r_2$ ). In sphere  $A_2$  there are two diametrically opposed openings: opening  $S_1$ , through which fluid is fed, and opening  $S_2$ , through which it is withdrawn. Assuming the motion of the fluid to be axis; mmetric and neglecting mass forces, the equations of motion can be written as follows in a spherical system of coordinates: Card 1/2

I. 29849-66

ACC NRI AP6013205

$$\frac{\partial}{\partial r} \left( \frac{v_r^2 + v_0^2}{2} \right) - \frac{D\psi}{i^2 \sin^2 \theta} \frac{\partial \psi}{\partial r} + \frac{1}{\rho} \frac{\partial p}{\partial r} = \frac{v}{r^2 \sin^2 \theta} \frac{\partial D\psi}{\partial \theta}$$

$$\frac{\partial}{\partial \theta} \left( \frac{v_r^4 + v_0^4}{2} \right) - \frac{D\psi}{r^2 \sin^2 \theta} \frac{\partial \psi}{\partial \theta} + \frac{1}{\rho} \frac{\partial p}{\partial \theta} = \frac{v}{\sin \theta} \frac{\partial D\psi}{\partial r}$$

$$\left( D = \frac{\partial^2}{\partial r^2} + \frac{\sin \theta}{r^2} \frac{\partial}{\partial \theta} \left( \frac{1}{\sin \theta} \frac{\partial}{\partial \theta} \right), \quad v_r = \frac{1}{r^2 \sin \theta} \frac{\partial \psi}{\partial \theta}, \quad v_\theta = -\frac{1}{r \sin \theta} \frac{\partial \psi}{\partial r} \right)$$

$$(1.1)$$

Here D is the Stokes operator; \$\psi\$ is the flow function; \$\vec{v}\_r\$, \$\vec{v}\_\theta\$ are components of the velocity. The article is devoted to a mathematical solution of the above problem. Orig. art. has: 11 formulas.

SUB CODE: 20/ SUBM DATE: 27Aug65/ ORIG REF: 003/ OTH REF: 001

Card 2/2 N

# APPROVED FOR RELEAST SEPEN 17, 2001 1. CTA-RDP86-00513R000721810002-

Concerning L.I.Shilutko's article "Posture defects and scoliesis." Ortop., travm. i protez. 26 no.12:78-79 D \*65.

(MIRA 19:1)

1. Iz kafedry gospital noy khirurgii (zav. - doktor med.nauk B.N.Esperov) Kubanskogo meditsinskogo instituta i Krasnodarskiy krayevoy klinichenkoy bol'nitsy (glavnyy vrach - zasluzhennyy vrach RSFSR G.V.Novitskaya). Submitted June 3, 1965.

Successful to the second of th

PHAPKINA, V.V.; PILATSKIY, P.O.

Automatic machine for assembling cardan axle crosspieces. Avt.prom. no.11:37-38 N '60. (MIRA 13:11)

1. Moskovskiy zavoi malolitrazhnykh avtomobiley i Mauchno-issledovatel'skiy institut tekhnologii avtomobil'noy promyshelnnosti. (Machine-shop practice)

IVANOV, S.N.; KHAPKINA, Z.A.

Effect of various methods of introducing the superphosphate and humus mixture on the assimilation of phosphorus by corn. Dokl. AN BSSR 7 no.7:485-487 Jl '63. (MIRA 16:10)

1. Belorusskiy nauchno-issledovatel'skiy institut pochvovedeniya Ministerstva sel'skogo khozyaystva BSSR.

EHAPKINOV, A., agronom po zashchite rasteniy

Disinfecting and losding machine. Zashch, rast. ot vred. i bol. 9
no.9125 '64.

(MIRA 17:11)

KEATKO, V. U.

Khapko, V. U.

"The Problem of Applying Hardening Processes to the Hub Portions of Rail-mond-Car Axles." Min Railways USSR. Moscow Order of Monin and Order of Labor Red Banner INst of Railroad Transport Engineers imenia. V. Stalin. Moscow, 1955 (Dissertation for the degree of Candidate of Technical Boilences)

SO: Anizhneya letopis! No. 27, 2 July 1955

ZOBEIN, N.P., doktor tekhn. nauk, prof.; ROGOV, A.Ya., kand. tekhn. nauk, dots.; KHAPKO, V.U. assistent.

Trudy MIIT no.93:3-72

157. (MIRA 11:4) (Car axles) (Rolling (Metalwork))

CIA-RDP86-00513R000721810002-0" APPROVED FOR RELEASE: 09/17/2001

ZOBNIN, N.P., doktor tekin. nauk, prof., KHAPKO, V.U., kand. tekhn. nauk, dotsent

Hardening treatment of axles after prolonged operation. Trudy MIIT no.159:30-52 '62. (MIRA 16:6)

(Car axles—Maintenance and repair)
(Metals—Cold working)

THE SEED LANGUE CHI/AND COMMENTS

ZOBNIN, N.P., doktor tekhm. nauk, prof.; ROGOV, A.Ya., kand. tekhm. nauk, dotsent; KHAFKO. V.U. kand. tekhm. nauk, dotsent; YUDIN, D.L., kand. tekhm. nauk, dotsent

Effect of the cold working depth on the service life of axle press joints. Trudy MIIT no.159:89-98 "62. (MIRA 16:6)

(Car axles)
(Metals—Cold working)

ZOBNIN, N.P., doktor teklin.nauk, prof.; KHAPKO, V.U., kand.tekhn.nauk, dotsent

Increasing the efficiency of the cutting of gear wheels for locomotive transmissions. Frudy MIIT no.200:5-20 164.

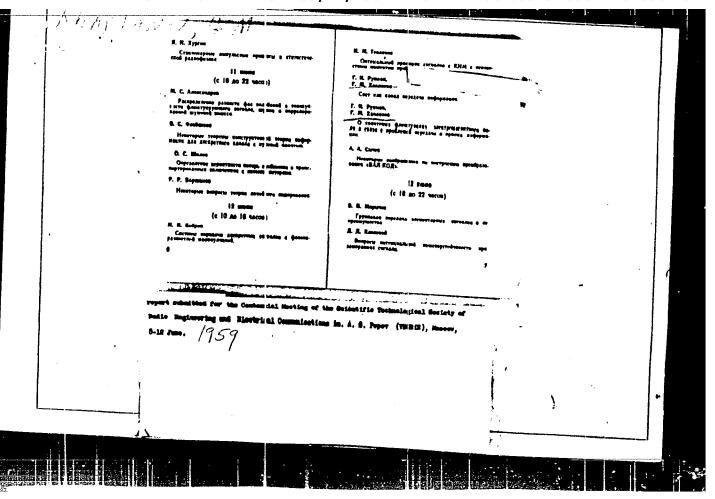
Mechanical hardening of gear wheels with the relieved surface of a worm cutter on the gear cutting machine. Ibid.:47-53

(MIRA 18:8)

G M KNAPLANOV

"Interchangeability of Tubes in Radio Engineering Apparatus" from Min6tations of Works Completed in 1955 at the State Union Sci. Res. Tust; Min. of Radio Engineering Ind.

Sc: B-3,080,964



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~	В. Я. Кребиер Пере 121 длук педарокация та воплиноване Трано не общену педару сведу  12 перево (с 10 до 16 часов)  М. И. Вробовоев  Нимуревое факазуваниямия более в телеводи	П. П. Едеско-паков  Установа до доуметнаймих прифиров  В В Вистем					
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## KHAPLANOV, E. O.

O kharaktere stepennykh razlozkeniy funktsiy, imeyushchikh na kruge skhodimosti odnu osobuyu tochku. Rostov N/D, Uchen. Zap. Un-Ta., 8 (1936), 92-130.

SO: Mathematics in the USSR, 1917-1947 edited by Jurosh, A. G., Markushevich, A. L., Rashevskiy, P. K. Moscow-Leningrad, 1948

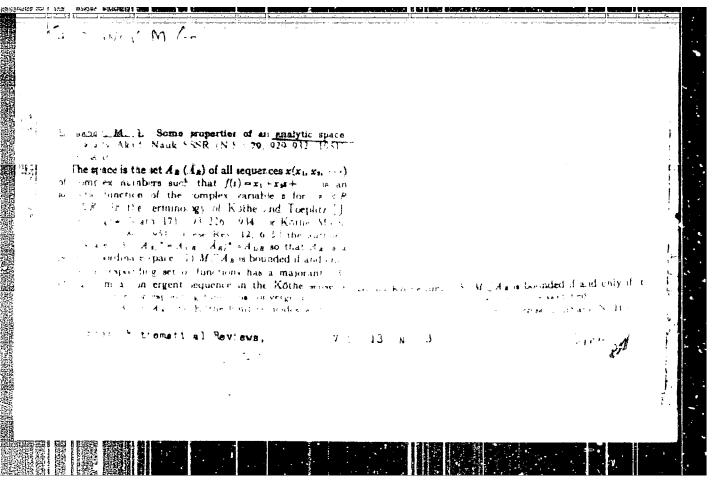
#### KHAPLANOV, M. G.

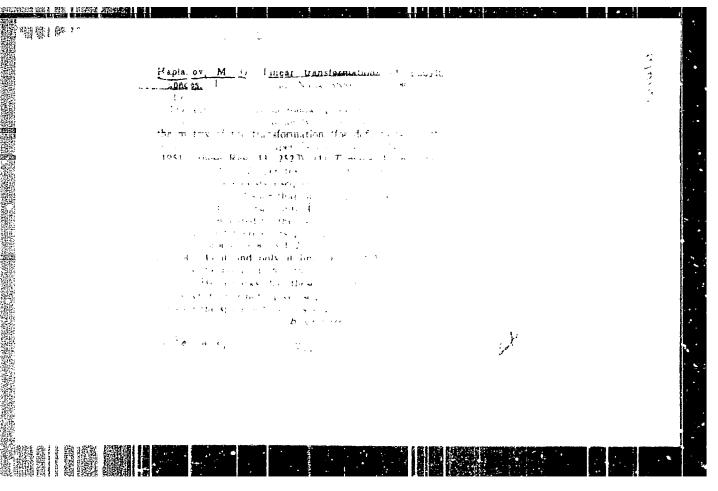
O koeffitsiyentakh ryada teylora odnogo klassa meromorfnykh funktsiy. DAN, 28 (1940), 679-684.

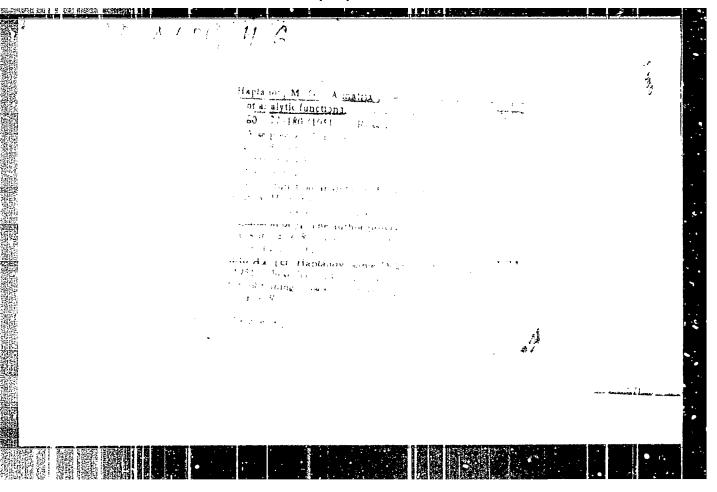
SO: Mathematics in the USSR, 1917-1947.
edited by Jurosh, A. G.,
Narkushevich, A. L.
Rashevskiy, P. K.
Moscow-Leningrad, 1948

"On the Taylor Coefficients of a Class of Metomorphic Functions,"

Prysico-Math. Inst., XXXXXXX States University Mixilian! Rostov State Univ. im Molotov







CHAPLANOV, H. C.

Functional Analysis

Matrix sign of the completeness of a system of analytic functions. Dokl. AN SSSR 83 No. 1 1952.

Rostovsky Gosudarstvenny Universitet: Im. V. M. Molotova Rcd. 26 Oct. 1951.

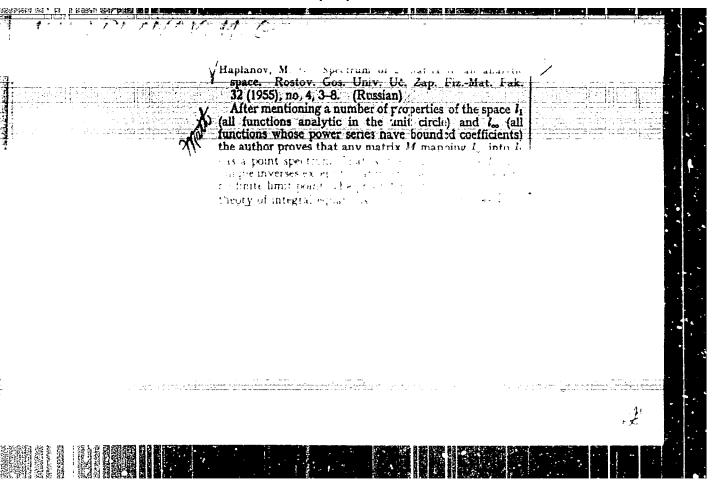
SO: Monthly List of Russian Accessions, Library of Congress, August 1955, Uncl.

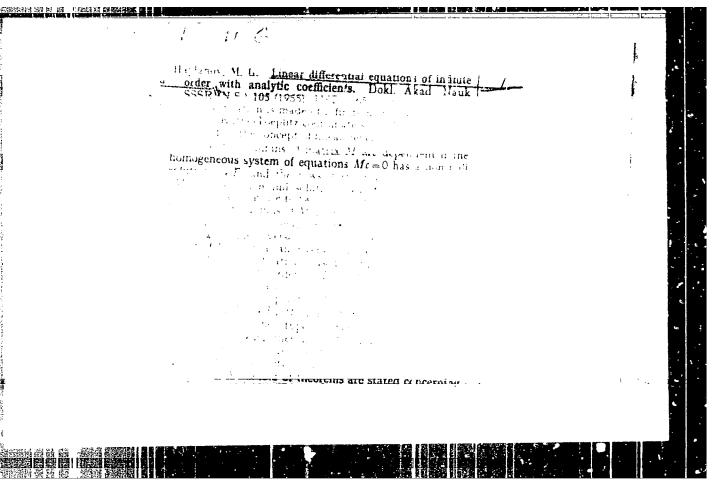
KHAFLANOV, M. G.				THE STATE OF THE S		
	norm /whitematics - matrices Eigenvalues I Sep 53	aracter of the Spectrum of a Ceres in Analytical Space," N. N. R.	that transforms an analytic space $A_R$ (0, $R = 1, 2, \ldots$ ) that transforms an analytic space $A_R$ (0 < $R < \infty$ ) into itself (M. G. Khaplanov, DAN, 8G, Nos 1, 2 (1951)). Notes that M. G. Khaplanov was the first to study the character of the spectrum of such matrices (DAN, 90, No 6, 1953). Studies the spectrum by the method of converging sequences of matrices. Generalizes M. G. Khaplanov's conditions	presence of purely point spectriues). Presented by Acad M. V.		
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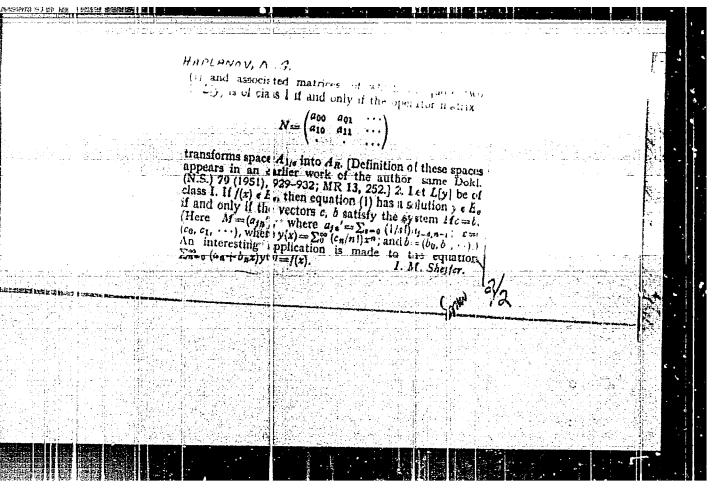
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GAKHOV, F.D.; KHAPLANOV, M.G.; AL'PER, S.Ya.

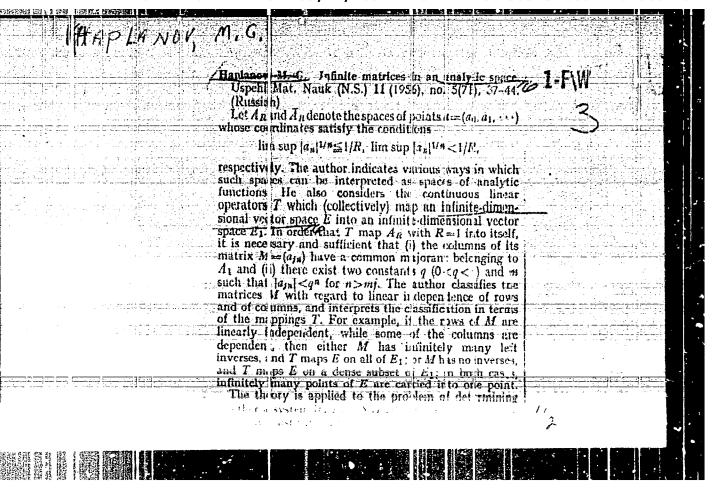
"Brief outline of mathematical analysis." A.IA.Khinchin. Reviewed by F.D.Gakhov, M.G.Khaplanov, S.IA.Al'per. Usp.mat.nauk 9 no.4: 266-275 '54.

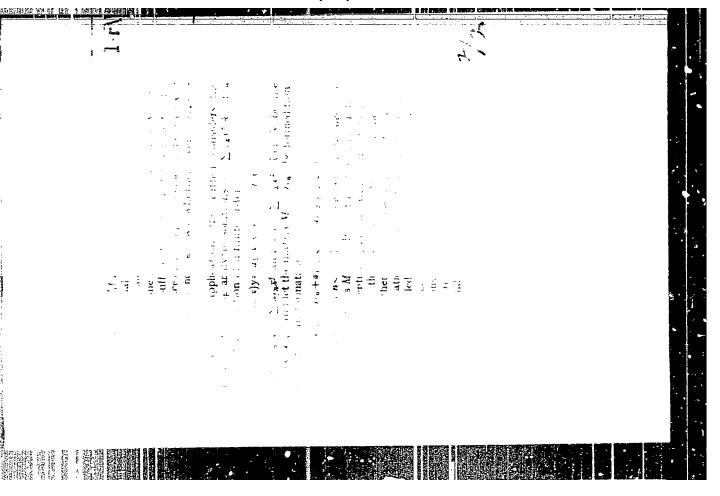
(Galculus) (Khinchin, Aleksandr IAkovlevich, 1894- )
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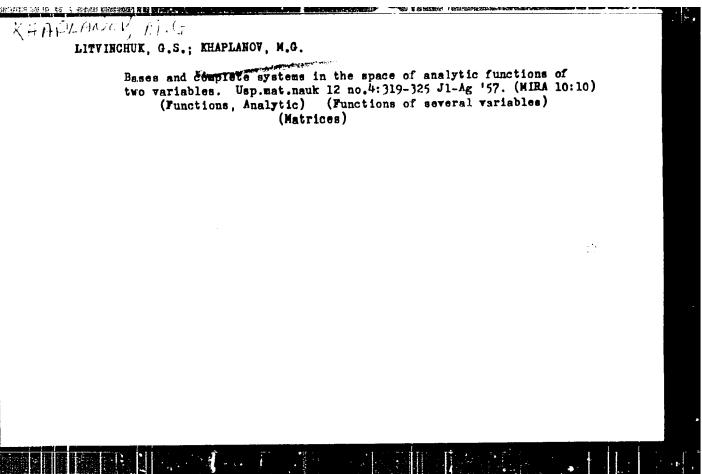












EHAPLAHOV, Mikhail Origor'yevich; ROZHANSKAYA, N.M., otv.red.;

SHKORIHOV, V.P., rod.; PAVLICHEKKO, H.I., tekhn.red.

[Theory of functions of complex variables] Teoriia funktsii kompleksnogo peremennogo; kratkii kurs. Rostov-na-Donu, Izd-vo Rostovekogo univ., 1959. 193 p. (MIRA 14:2)

(Functions of complex variables)

KHAFLANOV, M. G., Doc Phys-Math Sci -- (diss) "Linear operators in analytic space and their application." Khar'kov, 1960. 11 pp, (Ministry of Higher and Secondary Specialist Education, Ukrainian SSR, Khar'kov Order of Labor, Red Banner State Univ im A. M. Gor'kiy), 200 copies, free, bibliography at end of text (20 entries), (KL, 17-60, 138)

89036

S/044/60/000/009/006/021 C111/C222

16.1600

AUTHOR: Khaplanov, M.G.

TIPLE: Linear Operators in an Analytic Space

FEE:IODICAL: Referativnyy shurnal. Matematika, 1960, No.9, pp.57-56, Abstract No.10209. Uch.zap.Fiz-matem.fak. Rostovsk. un-t, 1959, Vol.43, No.6, pp.83-118

TEXT: The author considers spaces  $A_R$   $(\overline{A}_R)$ ,  $0 \le R \le \infty$ , of all sequences  $x(x_0,x_1,\ldots)$  the coordinates of which satisfy the condition

 $\overline{\lim_{n\to\infty}} \sqrt[n]{|x_n|} \leq \frac{1}{R} \left( \overline{\lim_{n\to\infty}} \sqrt[n]{|x_n|} < \frac{1}{R}, R < \infty \right). \text{ The topology in these spaces is}$ 

introduced according to the method of Köthe and Toeplitz (Köthe,G., Toeplits, 0., J.reine und angew.Math. 1934, Vol.171, pp.193-226). In several ways the spaces  $A_R$  and  $A_R$  can be realized as spaces of analytic functions in

certain regions of the complex plane. If especially the function

 $x(z) = \sum_{i=0}^{\infty} x_i z^i$  is adjoint to the sequence  $x(x_0, x_1, ...)$  then  $A_R(\overline{A}_R)$  becomes

the space of analytic functions in the open (closed) circle |z| < R ( $|z| \le R$ ), Carl 1/3

8/044/60/000/009/006/021 0111/0222

Linear Operators in an Analytic Space

and here the introduced topology is identical with the topology generally usual in these spaces. The first chapter of the paper contains the description of such topological notions in the  $A_R$  ( $\overline{A}_R$ ) as the convergence of the sequences, simple and strengthened boundedness of the subsets, and completeness. The second chapter treats the description of linear non-limit-operators which map an analytic space into another. Sasic results: Theorem 1: In order that a matrix  $\begin{bmatrix} a_{ik} \end{bmatrix}$  transforms as (artitrary) analytic space A into  $A_R$ ,  $R_2 \neq 0$ , it is necessary and sufficient that for every  $r < R_1$  the inequality  $\begin{bmatrix} a_{jn} \end{bmatrix} r^j \le r_n$  is satisfied, where  $j, n=0,1,\ldots$ , and the point  $c(c_0, c_1, \ldots)$  belongs to the dual space  $A^*$ .

Theorem 2: In order that the matrix  $\begin{bmatrix} a_{ik} \end{bmatrix}$  transforms the space  $\overline{A}_R$  into A it is necessary and sufficient that for all j, n and r < 1/R the inequality  $-a_{jn} \begin{bmatrix} r^n \le r_n \end{bmatrix}$  is satisfied, where the point  $c(c_0, c_1, \ldots)$  belongs to the Card 2/3

89036 B/044/60/000/009/006/021 C111/C222

Linear Operators in an Analytic Space

space. A.

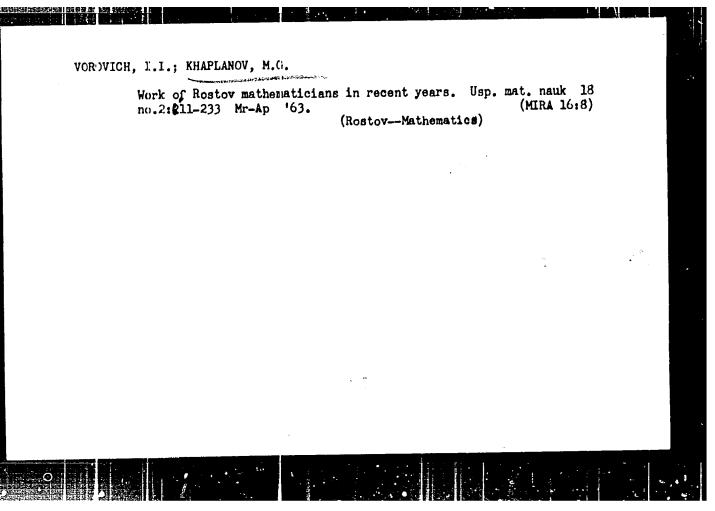
Furthermore the matrix is described which represents a linear continuous operator from the Banach space  $l_p$ ,  $1 \le p \le \infty$ , into the analytic space  $A_1$ . The given results and some of the proofs are published by the author in earlier papers (Doklady Akademii nauk USSR, 1951, Vol.79, No.6, and Vol.80, No.1,2).

[Abstracter's note: The above text is a full translation of the original Soviet abstract.]

Card 3/3

KHAPLANOV, M.G.	of single-valued analytic	,
Linear functions.	ionals in a space of single-valued analytic Trudy Sem., po funk.anal. no.3/4:115-121 '60. (MIRA 14:10)	
	(Functions, Analytic)	
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RUKEMAN, L.Ye.; RAYEVSKAYA, T.P.; KHAPMAN, V.L.

Insertion appliances of polyethylene in foot defects. Ortop., travm. 1 protez. no.1177-30163. (MIRA 16:10)

1. Iz detskey kliniki (zav. - doktor med. nauk L.Ye. Rukhman) Leningradskogo instituta protezirovaniya (dir. - dotsent M.V. Strukey).

12(2)

SOV/113-59-5-9/21

AUTHORS:

Zaytsev, K.S.; Khapov, V.S.

TITLE:

Experience in Testing Automobile Transmissions on

Test Stands

PERIODICAL:

Avtomobil'naya promyshlennost', 1959, Nr 5, pp 24-

25 (USSR)

ABSTRACT:

The authors describe briefly three types of test stands used for investigating the functioning of automobile transmissions at the Yaroslavl'Engine Plant. A torsion test stand for determining the static strength of assembled transmission components is shown by photograph, Figure 1. A test stand for wear and fatigue tests of transmissions is shown by photograph, Figure 2. With this device two transmissions may be tested simultaneously, while a third one serves as a reductor. A test

while a third one serves as a reduced stand for transmission gear shift mechanisms is shown by photograph, Figure 3. Gear shifting is performed automatically by a pneumatic device at

Card 1/2

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SOV/113-59-5-9/21

Experience in Testing Automobile Transmissions on Test Stands

a rate of six shifts per minute. As an example for a more complete utilization of these test stands, the authors mention the investigation of transmissions, containing parts made of different types of steel 12KhNZA, 18KhGT, 30KhGT and 15KhGNTA, where-by the best results were obtained with the latter steel. However, the proper temperature conditions must be selected when hardening parts made of steel 15 KhGNTA. It is possible to use steel-steel sliding friction bearings in YaMZ transmission, in case one of the bearing parts is parkerized. Steel and cast iron are not suitable for manufacturing tapered synchronizer rings since they have too high a wear and disturb the normal work of synchronizers . Further, the selection of the proper lubricant is of import-There are 3 photographs. ance.

ASSOCIATION: Yaroslavskiy motornyy zavod (Yaroslavl' Engine Plant) Card 2/2

ABRECK, TOM

AUTHORS:

Dmitriyev, P.P., Krasnov, N.N., Khaprov, Ye.N.

89-7-9/32

TITLE:

On the Problem of the Deflection of a Bundle in a Cyclotron

(K voprosu ob otklonenii puchka v tsiklotrone)

PERIODICAL:

Atomnaya Energiya, 1957, Vol. 3, Nr 7, pp. 45-47 (USSR)

ABSTRACT:

At first some previous works dealing with this subject are discussed. The experiments for the production of a deflected bundle were carried out by means of a meter cyclotron. According to computation a deuteron energy of 10.6 MeV corresponds to the cutput radius of 44 cm. The magnetic field here decreases by 2.2% and the coefficient for the decrease of the magnetic field amounts to n = 0.2. A schematical section through the chamber of the cyclotron is shown by a schematical drawing. An ion source with covered-up arcs was used on the occasion of these experiments. The shifting of the source and the control of its location takes place by remote control without switching off of the cyclotron. The high voltage is transferred into the duants in form of pulses with a frequency of 200 pulses per sec. The voltage amplitude between the duants amounts to from 90 to 100 kV. The current intensity of the inner bundle amounts to from 800 to 100 micro-

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On the Problem of the Deflection of a Bundle in a Cyclotron

89-7-9/32

ampères within the pulse. The current intensity of the deflected bundle can be registered on three places by means of the targets M1, M2, and M3. Measuring takes place simultaneously by means of a thermal and an electric method. The first experiments were carried out by means of the usual deflector with plane electrodes. With the shifting of the ion source a sharp maximum in the current intensity of the deflected bundle is observed. With the modification of the amplitude of the voltages between the duants a new location of the source had to be chosen for the purpose of obtaining the maximum current intensity. (Numerical data are given). It was possible to increase the current intensity of the deflected bundle (on the target M1) up to from 45-50% of the current intensity of the interior bundle. Next, a deflecting system with hyperbolic electrodes was investigated. The current intensities registered on all three exterior targets were equal to one another, which signifies a shortering of the horizontal dimensions of the bundle. There are 3 figures and 6 references, 4 of which are Slavic.

SUBMITTED:

February 8, 1957

AVAILABLE:

Library of Congress

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1. Ion bundles - Deflection - Test results 2. Cyclo-

trons - Operation

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KHAPROV, YE, N.

21(8)

Guldamashvili, A. I., Dmitriyev, P. P. SOV/89-5-6-18/25 AUTHORS:

Krasnov, N. N., Mishin, V. Ya.,

Khaprov, Ye. N.

The Production of the Isotope  $As^{74}$  by Means of a Cyclotron (Polucheniye izotopa  $As^{74}$  na tsiklotrone) TITLE:

Atomnaya energiya, 1958, Vol 5, Nr 6, pp 660 - 661 (USSR) PERIODICAL:

 ${\tt As}^{74}$  was obtained by the irradiation of metallic germanium ABSTRACT: with the external 10,8 MeV deuteron beam of the cyclotron

The characteristic feature of the target was the fact that the cooling water immediately reached the inner surface of the irradiated germanium plate. The germanium plate was cast

in a vacuum and was then ground to the dimensions 170.40.4 mm<sup>2</sup>. The deuteron beam (60-70 MA) is limited by a shutter so that

only a surface of 150.25 mm<sup>2</sup> of the germanium was irradiated.

The water consumption was 5 1/m.

Chemical separation was carried out as follows: After the irradiated sample had been boiled twice (for 15 to 20 minutes) in aqua regis, about 97-98 % of the activity had dissolved.

Card 1/3

The Production of the Isotope As<sup>74</sup> by Means of a Cyclotron

SOV/89-5-6-18/25

The solution was steamed-in and extracted with 11 n HCl (method according to reference 6). The arsenic carrier used weighed 50 Ag. Concentration of the arsenic isotope was carried out by the Marsh method (arsenic hydride). The two preparations, which were enclosed in an ampoule of 0,6 cm<sup>3</sup>, had an initial activity of 60 mC. The As<sup>74</sup> activity was measured by comparison with a Co<sup>60</sup> source by means of the micro-roentgenometer of the type "Kaktus" 30 days after irradiation. The total yield obtained by the formation of As<sup>74</sup> was: 25 AC/AA.ht 15 %. The half time was: T<sub>1/2</sub>= 18,4t0.4 d.

Professor B. S. Dzhelepov, I. P. Selinov, and Ye. Ye. Baroni interested themselves in this work. M. Z. Maksimov calculated the yield curve. Yu. A. Bliodze and I. I. Zhivotovskiy assisted in carrying out experiments. There are 2 figures and 10 references, 3 of which are Soviet.

Card 2/3

KHARA US			
	Mara, I. S. On a method of approximate conformal		
	mapping of a many cornered region onto the unit circle Dopovidi Aked. Nauk Ulitain. RSR 1983, 281-293. U.S. (Ukrainlan: Russian summary)		and the same of th
	A numerical inethod for approximating the constants  which cour in the application of the Christofiel Schwarts	2-25-5-6-2	
	nation for the conformal epresentation of polygonal trgions is given with examples. C. Salzer.		Manage
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	ay kampang angkan ng kapaggang Salahan Banggan ng Karamatan ng Kababana ng Kababana ng Kababana ng Kababana ng Kababana ng Kababana ng Ka Ng Kababana ng		Ž.
		Z.	

KHARA, I.S.; SAVIN, G.M., diisnyi chlen Akademiyi nank UHSR.

Investigation of stress concentration during dilation in infinite plates weakened by arched or trapesoid apertures. Dop.AN UESR no. 4:294-298 '53. (MLRA 6:8)

1. Kharkivs'kyi politekhnichnyi instytut ineni V.I.Lenina. 2. Akademiya nauk UESR (for Savin). (Flastic plates and shells)

KHARA, I.S.; SAVIN, G.M., diisnyi chlen Akademiyi nauk URSR.

Investigation of stress concentration in thick plates beside arched and trapesoid apertures supported by absolutely rigid rings. Dop.AN URSR no.4: 299-303 '53. (MLRA 6:8)

1. Kharkivs'kyi politekhnichnyi instytut imeni V.I.Lenina. 2. Akademiya nauk UNSR (for Savin). (Klastic plates and shells)

16(1) AUTHOR:

Khara, I.S.

SOV/20-126-6-15/67

TITLE:

Some Approximate Formulas in the Theory of Conformal

Mappings

PERIODICAL:

Doklady Akademii nauk SSSR, 1959, Vol 126, Nr 6,

pp 1210-1213 (USSR)

ABSTRACT:

The conformal mapping of the unit circle |z| < 1 onto an arbitrary closed polygon of the 5 -plane is carried out

by the Christoffel - Schwarz integral as is well-known. For three classes of polygons (which differ strongly from the circle) the author gives approximative formulas in which the sides of the polygons are explicitly expressed by the Christoffel-Schwarz constants. Let the polygon be e.g. a rectangle with the angles A<sub>1</sub>,A<sub>2</sub>,A<sub>3</sub>,A<sub>4</sub>, where the point S=1 is assumed to lie in the center of A<sub>1</sub>A<sub>2</sub>. Let the constants

 $-\varphi$ ,  $\varphi$ ,  $\widetilde{n}-\varphi$ ,  $\widetilde{n}+\varphi$  correspond to the angles. If it is  $\overline{\Lambda_2\Lambda_3}$ :  $\overline{\Lambda_1\Lambda_2}=\lambda>>1$  (extended rectangle), then it holds

Card 1/2

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Some Approximate Formulas in the Theory of Conformal Mappings

307/20-126-6-15/67

approximately  $A_1A_2 = \frac{\hat{\eta}}{2}$ ,  $A_2A_3 = \ln \frac{4}{\varphi}$ 

The author gives similar formulas in the two other more complicated cases. Since the lateral lengths are expressed by

 $f(x) = \frac{f(x)}{f(x)} | dx$ , the approximation integrals of the type

formulas are obtained by approximative calculation of these integrals.

There are 3 figures.

ASSOCIATION: Khar'kovskiy politekhnicheskiy institut imeni V.I. Lenina

(Khar'kov Polytechnical Institute imeni V.I. Lenin)

March 12, 1959, by S.L. Sobolev, Academician PRESENTED:

SUBMITTED: March 9, 1959

Card 2/2

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S/020/61/141/003/005/021 0111/0444

AUTHOR:

Khara, I. S.

TITLE:

A numerical method of solving eigenvalue problems

PERIODICAL

Akademiya nauk SSSR. Doklady, v. 141, no. 3, 1961,

574 - 577

TEXT:

Let s in the characteristic equation

$$1 + a_1 \lambda + a_2 \lambda^2 + \dots + a_n \lambda^n = 0$$

(1)

of a one-dimensional boundary value problem be such that the first so eigenvalues can be determined with an error not higher than some per cents. In the determination of the eigenvalues of the boundary value problems for

 $q_1(x)y'(x) + q_2(x)y''(x) + \dots + q_n(x)y^{(n)}(x) = \lambda r(x)y(x)$  (2)

where the coefficients are smooth, the homogeneous system of equations for  $y_k^{(1)} = y^{(1)}(\frac{k-1}{8})$  (k=1, 2, ..., s+1) be obtained by multiple integration. The following integrals are obtained:

Card 1/4

30718 S/020/61/141/003/005/021 C111/C444

A numerical method of soving ...

$$\int_{x_{\omega}}^{x_{\omega+k}} \int_{x_{\omega}}^{x} \dots \int_{x_{\omega}}^{x} \mathbf{r}(\mathbf{x}) \mathbf{y}(\mathbf{x}) d\mathbf{x}^{\nu}$$
 (3)

In order to replace those by finite sums, the following formulas

$$\int_{0}^{x_{h}} \int_{0}^{x} \dots \int_{0}^{x} \varphi(x) \psi(x) dx^{v} = b^{v} \sum_{i=1}^{m} A_{ki}^{(v,m)} \{\varphi\} \psi(x_{i}) + R_{k}^{(v,m)}; \tag{4}$$

$$\int_{0}^{x_{k}} \int_{0}^{x} \dots \int_{0}^{x} \psi(x) dx^{v} = \frac{b}{(v-1)!} \sum_{l=1}^{m} A_{k,l}^{(1,m)} [1] (x_{k} - x_{l})^{v-1} \psi(x_{l}) + \overline{R}_{k}^{(v,m)}; \quad (5)$$

$$A_{kl}^{(v,m)}[\phi] = \sum_{l=1}^{p} B_{k,l}^{(v,l^{*},p)} \phi(x_{l}), \quad x_{l} = \frac{l-1}{p-1}b, \quad x_{l} = \frac{l-1}{m-1}b, \quad (6)$$

$$B_{k,l,l}^{(v,m,p)} = b^{-s} \int_{0}^{x} \int_{0}^{x} \dots \int_{0}^{x} l_{j}^{(p)}(x) l_{j}^{(m)}(x) dx^{v}, \quad k = 2,3,\ldots,m,$$

are introduced, where  $l_j^{(p)}(x)$  and  $l_i^{(m)}(x)$  are the coefficients of the Lagrange polynomial for the knots  $x_j$  and  $x_i$ . The special case Card 2/4

S/020/61/141/003/005/021 0111/0444 A numerical method of solving... of (4) for  $\varphi(x) = 1$  is indicated with (4a). After a comparison of the formulas (4), (5), (4a) it is recommended: If  $r(x) = x^{\dagger}(y = 0, 1, 2)$ , then in (4)  $\varphi(x) = x^{\dagger}$ ,  $\psi(x) = y(x)$  is substituted, and the integrals (3) are calculated by aid of the coefficients  $A_{k,i}^{(v,m)}(x^{\psi})$ . But if  $r(x) \neq x^{\psi}$  is slowly variable, then (3) is calculated according to the formula (4a) with  $\Psi(x) = r(x)y(x)$ . If  $r(x) + x^{i}$ , being sufficiently quick variable, then (4) is used, where  $r(x) = \Upsilon(x)$ ,  $\Upsilon(x) = \gamma(x)$  and  $A_{k,i}^{(r,m)}[\varphi]$  are determined out of (6) with f(x) = r(x). For (2) with n = 2 the boundary conditions y'(0) = y(1) = 0 be given and (1) shall be constructed for a sufficiently large s. (2) is twice integrated from  $x_k$  to x, the integrals are replaced for  $x = x_{k+1}$ and  $x = x_{k+2}$  by finite sums according to (4), and two equations are are obtained; after elimination of y', the following relation is obtained: Card 3/4

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S/020/61/141/003/005/021 0111/0444

A numerical method of solving...

$$y_{k+2}^{(2)} p_{k+2}^{(2)} = y_{k+1}^{(1)} p_{k+1}^{(1)} + y_k^{(0)} p_k^{(0)}.$$
 (7)

V

(7) is completed by one of the two mentioned equations with k = 1, and s homogeneous equations with s unknown quantities. By means of three examples it is shown that the recommended method is partly far more exact than e. g. the ordinary difference method. At last one considers shortly the bending oscillations of bars which are loaded by single forces.

There are 3 Soviet-bloo and 1 non-Soviet-bloc references.

ASSOCIATION: Khar'kovskiy politekhnicheskiy institut im V. I. Le-

mina (Khar'kov Polytechnical Institute im. V.I. Lenin)

PRESENTED: July 1, 1961, by I. G. Petrovskiy, Academician

SUBMITTED: June 28, 1961

Card 4/4

32301 \$/020/61/141/004/005/019 C111/C222

AUTHOR:

Khara, I.S.

TITLE:

A method for the construction of Hermite's interpolation formula and quadrature formulas for solving boundary value problems and integral equations

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 141, no. 4, 1961, 822-825

TEXT: At first it is shown that the Hermitean formula with multiple knots can be obtained by a limiting passage from the interpolation formula of Lagrange

$$f(x) = \sum_{k=1}^{n} 1_{k}^{(n)}(x)f(x_{k}) + R(x) = \sum_{k=1}^{n} L_{k}^{(n)}(x) + R(x)$$
 (1)

by putting  $\begin{bmatrix} 1 \\ k = 1 \end{bmatrix}$   $(x-x_k)$  ;  $[(x-x_i)(x-x_{i+1})] = \omega_i(x)$ ;  $x_{i+1} = x_i + h$ 

and letting h→( .

Then the Hermitean formula is written for the interval [-b, b]: Card 1/4

X